United States Environmental Protection Agency and the EPA Region III states of Pennsylvania, Maryland, Delaware, District of Columbia, Virginia and West Virginia

Funding Stormwater Programs

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Executive Summary

The construction, operation and maintenance of a municipal separate storm sewer system (MS4) can involve significant expense, especially when regulatory requirements (stormwater Phase I or Phase II), flooding concerns, water quality issues (including total maximum daily loads, or TMDLs) and population growth are factored in.

This document is intended to assist local stormwater managers understand the alternatives available to fund their stormwater program. The most stable source of funding is generally the stormwater utility, so this document briefly lists the various funding alternatives then describes in more detail the three different types of stormwater utility rate structures and the basic steps involved in creating a stormwater utility.

What is a stormwater utility?

A stormwater utility (called a *stormwater authority* in Pennsylvania) is a mechanism to fund the cost of municipal services directly related to the control and treatment of stormwater. A stormwater utility will operate similarly as an electric or water utility. The utility will be administered and funded separately from the revenues in the general fund, ensuring a dedicated revenue source for the expense of stormwater management.

Stormwater Funding Alternatives

There are many different mechanisms that municipalities can use to fund their stormwater programs. The two most common funding options, Property Taxes/General Fund and Stormwater Service Fees, are discussed below along with several other funding alternatives.

Service Fees (including stormwater utilities)

Some communities include stormwater management costs as line items within their water or sanitary sewer enterprise system budgets. Water and sanitary sewer utilities charge customers fees for services rendered. Many of these base their customer fees on metered water flow. This is often not equitable because a property's metered water flow usually bears no relationship to the stormwater runoff it generates. For example, a shopping center typically generates a significant amount of stormwater runoff from the impervious area of its buildings and parking lots, but it usually uses a relatively small amount of metered water.

Many communities are now adopting stormwater service fees by means of a stormwater utility. A stormwater utility is a sustainable funding mechanism dedicated to recover the costs of stormwater infrastructure regulatory compliance, planning, maintenance, capital improvements, and repair and replacement. Stormwater fees are charged to taxpaying and tax-exempt properties and are typically based on property area. Stormwater utilities address the shortcomings and inequities of funding stormwater management by property taxes or water/sanitary service fees. There are more than 500 stormwater utilities in operation across the country. The average quarterly fee for a single family home is $11, which usually covers regulatory and operation and maintenance costs. Some communities charge as little as $2 per quarter, while others charge more than $40 per quarter to a single family home.

Property Taxes/General Fund

Many communities have funded stormwater management from property taxes paid into their general funds. However, there is great competition for municipal general fund dollars from other worthy municipal programs. Stormwater management improvements typically have a low priority, unless the municipality is reacting to a recent major storm or regulatory action. The total cost of stormwater management is not readily apparent when these costs are sprinkled among general fund departmental budgets. As stormwater management costs increase, general fund budgets are often not increased to meet those needs. In addition, tax-exempt properties do not support any of the cost, even though it can be shown that many of them, such as governmental properties, schools, colleges, and universities are major contributors of stormwater runoff. Finally, property taxes are based on assessed property value. The cost of stormwater service to individual properties bears no relationship to the assessed value of the property. Therefore, this method of recovering stormwater management costs might not be equitable.

Special Assessment Districts

If a stormwater construction project benefits only a portion of a municipality, it can be funded by fees assessed only to those properties within that area, which is called a *special assessment district*.

System Development Charges (SDCs)

SDCs (also known as *connection fees* or *tie-in charges*) are one-time fees commonly charged to new customers connecting to a water or sanitary sewer system to *buy into* the infrastructure that has already been built for them, to pay their fair share of the infrastructure expansion necessary to serve them, or a combination of both. The amount of the new customer's SDC is typically calculated on the basis of the potential water demand that the new customer will place on the system. Stormwater SDCs can also be developed.

However, the amount of a customer's stormwater SDC is typically tied to the area of the customer's property.

Grants and Low-Interest Loans

Stormwater management grants might be available for various types of projects on a state-by-state basis.

Environmental Tax Shifting

Environmental Tax Shifting is a concept that has been proposed by the Friends of the Earth and other environmental groups to redirect tax code incentives in a direction that would support energy conservation and sustain the environment. In 2001 the Environmental League of Massachusetts published a report prepared by the Tellus Institute titled, *Environmental Tax Shifting in Massachusetts*. This report discussed two creative proposals to change state tax policy to enhance stormwater management. One was a *pay to pave* tax that would be levied "on newly-paved surfaces on a per-square foot basis." The second was to eliminate the Massachusetts pesticide and fertilizer sales and use tax exemption. This would generate $1.1 million in annual revenue in Massachusetts. The report stated that 28 other states also exempt pesticides and fertilizers from sales and use taxes.

Types of Stormwater Utilities

There are three basic methods that stormwater utilities use to calculate service fees. These are sometimes modified slightly to meet unique billing requirements. Impervious area is the most important factor influencing stormwater runoff and is therefore a major element in each method (source: *Establishing a Stormwater Utility in Florida*, Florida Association of Stormwater Utilities, Chapter 4, Rate Structure Fundamentals).

Equivalent Residential Unit (ERU) (Also known as the Equivalent Service Unit (ESU) method): More than 80 percent of all stormwater utilities use the ERU method. Parcels are billed on the basis of how much impervious area is on the parcel, regardless of the total area of the parcel. This method is based on the impact of a typical single family residential (SFR) home's impervious area footprint. A representative sample of SFR parcels is reviewed to determine the impervious area of a typical SFR parcel. This amount is called one *ERU*. In most cases, all SFRs up to a defined maximum total area are billed a flat rate for one ERU. In some cases several *tiers* of SFR flat rates are established on the basis of an analysis of SFR parcels within defined total area groups. Having such a tiered-SFR, flat-rate approach improves the equitability of the bills sent to homeowners. The impervious areas of non-SFR parcels are usually individually measured. Each non-SFR impervious area is divided by the impervious area of the typical SFR parcel to determine the number of ERUs to be billed to the parcel.

Advantages

The relationship (or nexus) between impervious area and stormwater impact is relatively easy to explain to the public on the basis of you pave, you pay. The number of billable ERUs can be determined by limiting the parcel area review to impervious area only. Because pervious area analysis is not required, this approach requires the least amount of time to determine the total number of billing units.

Disadvantages

Because the potential impact of stormwater runoff from the pervious area of a parcel is not reviewed, this method is sometimes considered to be less equitable than the Intensity of Development (ID) or Equivalent Hydraulic Area (EHA) methods because runoff-related expenses are recovered from a smaller area base. This method could still be used to charge a fee to all parcels, pervious as well as impervious, to cover expenses not related to area, such as administration and regulatory compliance.

Intensity of Development (ID): This stormwater cost allocation system is based on the percentage of impervious area relative to an entire parcel's size. All parcels (including vacant/undeveloped) are charged a fee on the basis of their *intensity of development*, which is defined as the percentage of impervious area of the parcel. Rates are calculated for several ID categories. These ID categories are billed at a sliding scale, as shown in the table below. For example, an SFR parcel, which is categorized as *moderate development*, would pay $0.16/month/1,000 ft^2 (or $1.60 for a 10,000 ft^2 lot).

Category (impervious percentage range)	Rate per month per 1,000 square feet of total served area (Impervious plus pervious)
Vacant/Undeveloped (0%)	$0.08
Light development (1% to 20%)	$0.12
Moderate development (21% to 40%)	$0.16
Heavy development (41% to 70%)	$0.24
Very heavy development (71% to 100%)	$0.32

Advantages

The ID method accounts for stormwater from the pervious portion of parcels. Therefore, it can be more equitable than the ERU method. It accounts for completely pervious parcels and therefore can allow vacant/undeveloped parcels to be billed. If a parcel's impervious area is increased slightly because of minor construction modification, it probably would not be bounced up into the next higher ID category. This reduces the time required for staff to maintain the billable unit master file.

Disadvantages

Parcels are grouped into broad ID categories. Parcels are not billed in direct proportion to their relative stormwater discharges. This method can be more difficult to implement than the ERU method because parcel pervious areas and impervious areas need to be reviewed. It is also more complicated to explain to customers than the ERU method.

Equivalent Hydraulic Area (EHA): Parcels are billed on the basis of the combined impact of their impervious and pervious areas in generating stormwater runoff. The impervious area is charged at a much higher rate than the pervious area.

Advantages

The EHA method accounts for flow from the pervious portion of parcels. Therefore, it is often seen to be more equitable than the ERU method. It accounts for undeveloped/ vacant parcels and allows them to be billed. It is perceived to be fairer than the ID method because parcels are billed on the basis of direct measurements of pervious and impervious areas to which hydraulic response factors are applied to determine a unique EHA for such parcels.

Disadvantages

Because pervious area analysis is required in addition to impervious area, this approach requires more time to determine the total number of billing units. It is also more complicated to explain to customers than the ERU method.

Creation of a Stormwater Utility

The following are the typical steps involved in creating a stormwater utility.

Development of a Feasibility Study

The first step is to develop a study that provides the community with enough information to decide if it makes sense to proceed to implementation. The feasibility study will typically address preliminary revenue requirements (usually from current stormwater budgets), a preliminary assessment of the billing area to determine the SFR billing rate, the service fee method to use and credits to provide, the preliminary rate charge for each ERU, and the responsible party for billing. The feasibility study is then presented to municipal staff and officials to decide whether to proceed with development of the utility.

Create a Billing System

If the municipality decides after the feasibility study to continue development of a stormwater utility, a billing system is then created. This involves collecting user data, collecting parcel area data (such as ownership and impervious area for each parcel), and developing a system to bill users. The two most common stormwater billing systems are (1) a stormwater user fee with an existing water/sewer user fee bill and (2) non-ad valorem assessments. Approximately 80 percent of stormwater utilities use the first approach mainly because it is cost-effective due to the fact that an existing water and sewer billing system is already in place.

Roll Out a Public Information Program

Critical throughout the stormwater utility development process is a strong public education program. Many people are unaware of the increasing cost of stormwater management and the options to fund it. A well-funded stormwater program can help reduce flooding, improve drought conditions, create better fishing and recreation, and improve water quality. An organized public information and education effort, which typically involves the following components, is essential to the success of a stormwater utility:

- *Identifying key users and groups.* Two potential groups to target include (1) universities schools, and shopping malls that generate a significant amount of runoff and often receive high stormwater bills; and (2) tax-exempt properties, such as universities, schools and churches, that do not contribute property taxes into the general fund, which traditionally have funded stormwater management.
- *Establishing an advisory committee.* Include a cross-section of the community including representation from the university, business, nonprofits, churches, developers and shopping center owners.
- *Creating a stormwater utility Web site*. The Web site should post appropriate progress documents and develop a *frequently asked questions* page.
- *Preparing pamphlets and presentations*. A brochure describing the need for the stormwater utility, rate method, and projected rates should be prepared as well as an electronic presentation for use at public meetings.
- *Meeting with key user groups and the media*. Presentations to civic groups and the media should be given. One-on-one meetings with customers projected to receive the highest bills should occur.
- *Distributing information before initial billing.* The stormwater utility brochure should be sent to all customers before billing. If possible, include the customer's actual projected bill.

Adopt an Ordinance

An ordinance will provide legal authority for establishment of the utility. An example stormwater utility ordinance from Takoma Park, Maryland, is at **www.takomaparkmd.gov/code/Takoma_Park_Municipal_Code/index.htm** (see Title16 Stormwater Management, Chapter 16.08 Stormwater Management Fee System).

Provide Credits/Exemptions

Credits or exemptions are often built into the ordinance, and can be used to provide incentives for certain practices or relief from utility fees to certain types of land uses. Credits

should be clearly described and can include installation of approved retention/detention best management practices (BMPs), installation of approved BMPs such as rainspout disconnections or porous pavers, and educational programs for employees. Exemptions are often granted for undeveloped (100 percent pervious) land because the impervious area is usually used to calculate the rate. Other exemptions can include roads (because the municipality typically owns the roads) and parcels on waterways (which do not discharge to the municipality's storm drain system), although not all programs allow these last two exemptions.

Implementation

The first bill is the most important—many customers do not focus on the new stormwater fee until they actually receive their first bill. Customers should be notified several months in advance of the date of billing initiation and their estimated fee. A telephone hot line, e-mail service and website should be created to address questions and concerns. In addition, the municipality should be prepared to address legal challenges to its stormwater fee. The municipality should also be prepared to maintain the master account file, including developing a process for updating the billing unit data for an existing customer and for entering the data for a new customer.

Barriers to Creating a Stormwater Utility

There are typically two barriers to creating a stormwater utility: legal and political.

Legal Barriers

In EPA Region 3, all states have legal authority to establish stormwater utilities (Pennsylvania has a bill to clarify its legal authority). A summary of the current or proposed legal authority within EPA Region 3 states is presented below (cities within that state with stormwater utilities are indicated in parenthesis):

- **Delaware** (Wilmington): Chapter 40, Title 7 of the Delaware Code authorized the creation of stormwater utility districts.
- **Maryland** (Montgomery County, Takoma Park): Section 4-204(d), Environmental Article, of the Annotated Code of Maryland, authorizes municipalities to create stormwater utilities.
- **Pennsylvania** (Philadelphia—bills water customers for stormwater management according to water meter size): Pennsylvania HB88—*The Comprehensive Watershed Stormwater Act* is expected to be introduced in the fall of 2007. It requires counties to develop Comprehensive Watershed Stormwater Plans; requires municipalities to implement infrastructure improvements and recover costs from counties; authorizes counties to charge annual fees and assessments to pay for the program.
- **Virginia** (Chesapeake, Hampton, James City, Newport News, Norfolk, Portsmouth, Prince William County, Richmond, Suffolk, Virginia Beach): Section 15.1-2114 of the Virginia Code is the enabling legislation that gives local communities the authority to establish stormwater utilities.
- **West Virginia** (Fairmont, Beckley, Morgantown): The West Virginia Legislature amended sections 8-20-1 et seq. and 16-13-1 et seq. of the West Virginia Code in 2001 so as to authorize municipalities to include the operation and management of stormwater systems as part of a municipal combined waterworks and sewerage system.
- **District of Columbia** (D.C.: Flat monthly fee for residences; others are billed on the basis of metered water flow): The District of Columbia Storm Water Permit Compliance Enterprise fund was established in 2000 by the D.C. City Council. The legislation was titled, *Storm Water Permit Compliance Amendment Act of 2000.*

Political Barriers

It usually takes at least one *champion* to help create a stormwater utility, especially in the face of local political opposition. A public information program that visually presents the inadequacies of the community's current stormwater management program, coupled with the benefits that have occurred at communities with stormwater utilities would help garner public support to offset opposition to the fee. A senior manager (city manager or county administrator, for example), or a senior elected official, such as the mayor, usually provides that steadfast leadership. It is important to explain the benefit of implementing a stormwater utility to opinion makers. Opposition from local news outlets has sometimes been able to stop the implementation of stormwater utilities (often by using inaccurate terms such as a *rain tax*). Educational materials and public meetings are necessary to show the financial benefit of stormwater utilities. When the public is clearly informed of the financial benefit to them—along with the many environmental benefits such as improved flood control, fishing, and recreation—support usually follows.

EPA Region 3 Stormwater Funding Case Studies

Wilmington, Delaware

Wilmington has a combined sewer system and used a three-step approach to establish a stormwater utility to recover costs related to stormwater management on a fair and equitable basis.

1. *Determine stormwater revenue requirements*: The city maintained a single water/sewer enterprise fund. The city's combined sewer costs were allocated to three buckets: a wholesale sewer customer, city retail sewer customers, and city stormwater customers. The annual

stormwater cost came to approximately $4.2 million—equal to approximately 43 percent of the city's total combined sewer costs.

2. *Determine stormwater billing units*: City staff reviewed several stormwater billing approaches and selected the ESU method, which would bill parcels solely on the basis of their impervious area. The city had accurate impervious area data for all SFR and multi-family residential (MFR) parcels. This SFR/MFR category comprised 75 percent of all parcels. The median impervious area of all SFR/MFR parcels was approximately 789 square feet, which was defined as one ESU. The SFR/MFR parcels were divided into four tiers to be billed at four separate flat rates. Condominium complex impervious areas were calculated using geographic information system (GIS) data. The remaining properties' impervious areas were estimated by applying predefined stormwater coefficients to the total property area. The impervious areas of these properties were converted to ESUs. All parcels were to be billed except for city-owned parcels. The estimated total number of billable ESUs was 155,363.
3. *Calculate stormwater fees*: The annual stormwater cost was increased to include bad debt and stormwater credits, resulting in adjusted annual stormwater revenue of approximately $5.1 million. The quarterly stormwater fee, effective January 2007, was calculated to be $8.141 per quarter per ESU. A four-tier rate schedule, with a fixed fee for each impervious area tier, was established for all SFR/MFR parcels. For all other parcels, the quarterly stormwater charges were based on their individual ESUs. Therefore, a parcel with 7,890 square feet of impervious area would be billed for 10 ESUs, or $81.41 per quarter.

Takoma Park, Maryland

(**www.takomaparkmd.gov/publicworks/stormwater.html**)
Takoma Park established a stormwater utility in July 1996. It is responsible for constructing and maintaining the stormwater system, reviewing stormwater management plans, inspection and enforcement activities, watershed planning, and water quality monitoring.

User fees are based on the amount of impervious area on a property. The annual fee for single family residences is $48.00 and became effective on July 1, 2003. Nonresidential and multifamily parcels are charged a fee on the basis of their measured impervious area as compared to the impervious area of an average SFR parcel (i.e., the ERU method). One ERU is equal to an impervious area of 1,228 square feet. Tax-exempt parcels also pay the fee with the exception of property used for public purposes and owned by the state, county, or city agency or volunteer fire department.

Suffolk, Virginia

(**www.suffolk.va.us/pub_wks/index.html**)
In 2004 Suffolk spent approximately $1.5 million from its taxpayer-supported general fund on stormwater management. In 2006 it implemented a stormwater utility, using the ERU method, at an initial rate of $3.95 per month per ERU. In Suffolk, one ERU is equal to 3,200 square feet of impervious area and is the weighted average for both SFR and MFR parcels. The rate increased to $5.20 per month effective July 2007. The fee is collected via property tax bills due in June and December. Schools, state, and federal developed parcels pay the fee. They are exempt only if they have a separate stormwater permit and discharge directly to a body of water not maintained by the city.

Additional Resources

National Association of Flood and Stormwater Management Agencies. *Guidance for Municipal Stormwater Funding*.
www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

University of Maryland, Environmental Finance Center.
www.efc.umd.edu

Indiana University-Purdue University Indianapolis. *An Internet Guide to Financing Stormwater Management*.
http://stormwaterfinance.urbancenter.iupui.edu

Natural Resources Defense Council. *Funding and Gaining Support for Stormwater Programs.*
www.nrdc.org/water/pollution/storm/chap4.asp

Florida Stormwater Association, *Establishing a Stormwater Utility in Florida.* **www.florida-stormwater.org/manual.html**

Kaspersen, J. 2000. The Stormwater Utility, Will It Work in Your Community? *Stormwater* 1(1).
www.forester.net/sw_0011_utility.html

U.S. Environmental Protection Agency, Watershed Academy. *Catalog of Federal Funding Sources for Watershed Protection.*
http://cfpub.epa.gov/fedfund

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NOTE: This document is not law or regulation; it provides recommendations and explanations that MS4s may consider in determining how to comply with requirements of the CWA and NPDES permit requirements."